Why Risk It? The Effect of Risk and Time Preferences on Microfinance Loan Default

Nike Start
International & Development Economics
University of San Francisco

Introduction

Microfinance is widely recognized as a powerful method for poverty alleviation. However, little is known about the characteristics of those who default on their loans. This study investigates whether non-delinquent and delinquent borrowers reveal any difference in their level of risk and time preference through an artefactual field experiment. Understanding the behavior of borrowers is important to mitigate default for microfinance lenders.

Hypothesis:

H_0 = 0 There is no difference between the level of risk in non-delinquent and delinquent borrowers
$H_A \neq 0$ There is a difference between the level of risk in non-delinquent and delinquent borrowers

H_0 = 0 There is no difference between the level of patience in non-delinquent and delinquent borrowers
$H_A \neq 0$ There is a difference between the level of patience in non-delinquent and delinquent borrowers

Methodology:

To test my hypotheses, I carried out an artefactual field experiment among 97 microfinance borrowers of the National Microfinance Bank (NMB) of Jordan in June 2012.

Borrowers were randomly chosen from a list of borrowers from NMB are identified in this sample as having a business loan that was less than or equal to 3500JD (≈ $4,948.31).

Table 1 — Summary Statistics of Sample by Type of Borrower
(Means, Standard Deviations, Min|Max)

	Total	Non-delinquent	Delinquent	T-Statistic
Age (years)	38.216	37.098	40.111	
	(10.332)	(9.342)	(11.71)	1.4278*
	20|62	20|58	20|62	
Currently Employed	.381	.393	.361	
	(.488)	(.492)	(.487)	-0.3136
	0|1	0|1	0|1	
Education[1]	2.608	2.426	2.916	
	(1.432)	(1.371)	(1.5)	1.6429*
	0|7	0|7	0|6	
Loan Size	767.391	735.833	826.562	
	(560.682)	(578.945)	(528.537)	0.7374
	300|3500	300|3500	300|2200	
HH Income	404.597	382.766	433.914	
	(196.957)	(180.439)	(216.386)	1.1657
	150|1000	150|900	155|1000	
Female	.907	.934	.861	
	(.291)	(.249)	(.350)	-1.1989
	0|1	0|1	0|1	
Sample Size	97	61	36	

[1]1=Primary, 2=Basic, 3=Secondary, 4=Some College, 5=A.A. Degree, 6=B.A/B.S. Degree, 7=Graduate school
*** p<0.01, ** p<0.05, * p<0.1

Model

My Linear Probability Model, looking at the characteristics of risk, estimates:

$$P(Y_i = 1|X_i) = \beta_0 + \beta_1 R_i + \beta_2 RI_i + \beta_3 TI_i + \beta_4 X_i + \varepsilon_i \quad (1)$$

Y_i = 1 if an individual borrower *i* is a non-delinquent borrower and 0 if an individual borrower *i* is a delinquent borrower
βR_i, the level of risk aversion captured from the experiment
$\beta_2^1 IR_i$, a risk index variable
$\beta_3 TI_i$, a trust index variable, and
$\beta_4 X_i$ and ε_i, observed and unobserved factors, respectively

My Linear Probability Model, looking at the characteristics of time preference, estimates:

$$P(Y_i = 1|X_i) = \beta_1 P_i^S + \beta_2 P_i^W + \beta_3 FTI_i + \beta_4 R_i + \beta_5 ITP_i + \beta_6 X_i + \varepsilon_i \quad (2)$$

Y_i = 1 if an individual borrower *i* is a non-delinquent borrower and 0 if an individual borrower *i* is a delinquent borrower
βP_i^S, a dummy variable for an individual who has a strong present-biased
$\beta^1 P_i^W$, a dummy variable indicating a weakly present-biased individual
$\beta_3^2 FTI_i$, a dummy variable representing an individual with future-biased time inconsistency (dummy for time-consistent preferences is omitted)
βR_i, the level of risk aversion captured from the experiment
$\beta_5^4 ITP_i$, a time preference index variable
$\beta_6 X_i$ and ε_i, observed and unobserved factors, respectively.

Results

Table — 2 Risk by Type of Borrower

VARIABLES	(1) Type of Borrower	(2) Type of Borrower	(3) Type of Borrower	(4) Type of Borrower	(5) Type of Borrower
Risk Experiment	0.0427	0.0387	0.0588*	0.0590**	0.0558**
	(0.0266)	(0.0288)	(0.0312)	(0.0240)	(0.0238)
Risk Index			-0.281*	-0.213**	-0.201*
			(0.150)	(0.105)	(0.102)
Trust Index					-0.0956
					(0.0813)
Constant	0.474***	-0.102	-0.541	0.319	0.223
	(0.108)	(0.948)	(1.254)	(0.845)	(0.884)
Observations	97	82	73	73	71
R-squared	0.026	0.138	0.208	0.611	0.619

Notes: Type of borrower = 1 indicates a non-delinquent borrower. I control for female, age, age^2, marital status, education, log household income, log loan size, currently employed, rural branch, Ramadan, researcher, and enumerator.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3 — Time Preference by Type of Borrower

Variables	(1) Type of Borrower	(2) Type of Borrower	(3) Type of Borrower	(4) Type of Borrower	(5) Type of Borrower	(6) Type of Borrower
Strong Present Bias	0.0990			0.0197		
	(0.110)			(0.0863)		
Weak Present Bias		-0.0705			0.150	
		(0.129)			(0.104)	
Future Bias Time Inconsistency			0.242*			0.101
			(0.125)			(0.121)
Time Preference Index				0.0631	0.0839	0.0533
				(0.153)	(0.155)	(0.149)
Constant	-0.233	-0.0763	-0.114	0.390	0.256	0.387
	(0.947)	(0.957)	(0.963)	(0.824)	(0.815)	(0.815)
Observations	82	82	82	77	77	77
R^2	0.127	0.121	0.145	0.576	0.590	0.580

*** p<0.01, ** p<0.05, * p<0.1
Robust standard errors in parentheses
Notes: Type of borrower = 1 indicates a non-delinquent borrower. I control for risk aversion (risk experiment), observable characteristics (age, age^2, gender, education, currently employed, rural branch, marital status, log income, log loan size), and controls for Ramadan, researcher, and enumerator.

Discussion

I reject both hypotheses and report that there is a difference in the level of risk-aversion and time preferences between non-delinquent and delinquent borrowers

The findings reveal that non-delinquent borrowers are more likely to be risk-seeking individuals and are more impatient than delinquent borrowers, contradicting current literature on risk-aversion and time preference.

Further research should be conducted to see the effects of Ramadan on individual's time preference.

Implications

One of the shortcomings of this paper is the limited sample size of the borrowers in addition to the uneven distribution of non-delinquent and delinquent borrowers. It would be ideal to have a roughly 50/50 split of non-delinquent and delinquent borrowers to provide a more equivalent variance between the two groups.

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